LOCKING DEVICE FOR ELECTRONIC EQUIPMENT

BACKGROUND OF THE INVENTION

Cross reference to related applications

This application is a continuation in part of application serial number 10/339,711 file on January 9, 2003, which is a continuation10/273,819 filed on October 18, 2002, which is a continuation in part of U.S. Patent Number 6,469,615 issued on October 22, 2002 which is a continuation in part of provisional application serial number 60/065941 filed on October 27, 1997 the contents of all are incorporated herein as though recited in full.

Field of the Invention

The device relates to a safety and security device that, once activated, allows the electronic equipment to run for a preprogrammed period. In some embodiments, the device is used as an antitheft device as without the code use of the device is prohibited, preventing theft and resale of protected equipment.

Brief Description of the Prior Art

Electronic devices offer a temptation to thieves, as they are easy to resell due to lack of distinctive features. Although people will mark their electronic devices, such as cell phones, computers, etc., unless the stolen device is resold through a legitimate vendor, there is no hope for recovery.

SUMMARY OF THE INVENTION

The locking device disclosed is for use on electronics, such as computers, cameras, cell phones, VCRs, DVDs, etc. and mechanical equipment, tools, heavy equipment and machinery, as well as various wheeled vehicles. The device provides the option of permitting the equipment to be operarable or inoperable for a predetermined period of time, selection of specific operable features or being completely shut down with operation permitted only through code entry.

The operating control system is for use with equipment having a power source, an input device, at least one activation/deactivation member, and a control member. The control member, such as a separate chip or programming embedded into existing chips, either uses a compatible input device to enable the input of user access codes or uses an input device inherent in the equipment, such as the buttons on a cell phone. The independent input device would generally be used in situations where the control device is being added into the equipment after manufacture or the equipment is too small for an integral input device. Input can also be through wireless means, such as infra red, Bluetooth, telephone signals, etc. Although adding the control member onto an existing piece of equipment does not provide the extent of protection that is achieved by incorporating the control device at time of manufacture, it does provide more security than without the device. In the preferred embodiments, a readout panel, either integral, for example a cell phone, computer or camera screen, or separate, such as a TV, card reader, remote monitoring site, is used to monitor the status of the equipment. The readout can also be an audio output, or combination of audio and visual, thereby enabling the control device to be programmed via phone or by the visually impaired. The control member is in communication with the input device, readout panel (if included), power source, and activation/deactivation

member. The control member prevents operation without the entry of a user code and can, in some embodiments, be programmed to control the internal functions of the electronic device, such as permitting the viewing of certain channels, or by a certain person, on a TV during a predetermined time, and other channels, or by another party, during other times. Secondary access codes permit the system to be programmed to permit only activation of the device, eliminating any reprogramming options, by those having the secondary codes. The device can also permit cell phone calls out, but not in, or vise versa, during set time periods. Any equipment having electronic components can be incorporated with the disclosed device to provide the ability to selectively determine which features are active for specific time periods. In digital equipment, such as cameras, camcorders, etc, the capabilities are increased due to the versatility of the digital technology and it should be noted that any of the capabilities disclosed herein with one digital device can be incorporated in other digital devices.

The control system includes a programmable timer to communicate with the control member thereby enabling access to the selected feature for the predetermined period of time entered at the input system. Preferably the memory within all embodiments is non-volatile thereby preventing a loss of the settings upon loss of power, although in some embodiments a volatile memory can be beneficial. A clock member, if not already inherent in the device, can be added to track time, activate, and deactivate the timer based on user input. In cellular phones, computers, cameras, etc., the operation of the equipment is dependent upon microchips, or microprocessors, and would not require the wiring of a power tool, or other non-processor based equipment. The versatility of the locking device enables it, as disclosed in co-pending

application SN 09/178,837, to be use on equipment such as hand tools, electronics or wheeled vehicles as well as cell phones, digital and non-digital cameras, etc.

BRIEF DESCRIPTION OF THE DRAWINGS

The advantages of the instant disclosure will become more apparent when read with the specification and the drawings, wherein:

FIGURE 1 is a side view of an example hand tool incorporating the locking device;

FIGURE 2 is a cutaway view of the interior of the locking arm and solenoid of the instant invention;

FIGURE 3 is a top view of an example controller configuration;

FIGURE 4 is the schematic of an example wiring for the locking device for use with a hand tool;

FIGURE 5 is a cutaway side view of the interior of the hand tool of Figure 1;

FIGURE 6 is a cutaway side view of an alternate embodiment of a hand tool utilizing the disclosed locking device;

FIGURE 7 is a side view of the instant device for use with a air tool system;

FIGURE 8 is a schematic of the wiring for use with the locking device used in conjunction with air tools;

FIGURE 9 is a schematic of the wiring for use with electronic devices;

FIGURE 10 is a schematic of the wiring for use with the locking device incorporating the analogue function;

FIGURE 11 is a flow chart for programming a multi-operation device;

FIGURE 12 is a flow chart for programming a single operation device;

FIGURE 13 is a flow chart for programming an electronic device including a reset option;

FIGURE 14 is a flow chart for programming an electronic device designating specific events, times and users;

FIGURE 15 is a flow chart of a primary and secondary user system using a timed base;

FIGURE 16 is a flow chart of the programming portion of the flow chart of Figure 15;

FIGURE 17 is a flow chart for a system that shuts down and requires reentry of the password upon the loss of power;

FIGURE 18 is a flow chart for a system that monitors the number of units used;

FIGURE 19 is a flow chart that basis shut down upon power fluctuation; and

FIGURE 20 is a flow chart that differentiates between power outages and complete power removal.

DETAILED DESCRIPTION OF THE INVENTION

The disclosed invention relates to a programmable device having multiple user programmable features including, but not limited to, restricting accessibility to specific portions of the device, or only to specific people, and a coded locking mechanism that discourages theft and restricts or eliminates use during a predetermined time frame. In addition to the inherent advantages obtained through the locking device as disclosed, further safety advantages are achieved simply by its existence. It will be obvious to anyone who buys an item containing the locking device that unless the seller has the code, the item is most likely stolen. The disclosed

locking device controls the activation of the item, preventing activation, once the current time period has lapsed without the entry of user codes. Without access to the codes, the item is useless and unsaleable.

Electronic devices, such as cell phones, palm pilots and other hand held data access devices, cameras, computers, VCRs, televisions, MP3 players, etc. all fall into the category of easy theft devices with high resale value. Their use of programmable chips, however, makes these valuable devices easy to modify to incorporate the advantages of the disclosed system. The use of microchips, microprocessors or analog, technology, however, permits various functions to be monitored, such as scheduling service, based on use time or the number of hours an item has been used.

Alternatively, in devices such as VCRs and televisions, the system can be a separately encased unit that is retrofitted into the power source, such as the power cord or plug. In the embodiments where it is feature added on after time of manufacture, the control system would be a separate unit, or units, that would work through the power cord or plug or, such as in the case of computers, a plug in board. In some embodiments, it can be necessary to have two pieces to the add-on unit to enable easy access to the input area while still connecting with the power input of the equipment. The add-on units are most applicable for use on TV's, radios, stereos, computers and other larger equipment that can provide a location for a connection between the power supply and the equipment. It should be noted, however, that this embodiment would not provide the multiple control capabilities enabled by a system that is integrated into the equipment at time of manufacture.

Access through keypads or other input means can be used, such as magnetic card readers, fingerprint or retinal recognition, standard keys, telephone signals, or any applicable wireless technology, etc. The method of programming the device is dependent upon the type of device, size, etc. For example, touch key scanning, swipe cards, or other methods of transmission having static data, can easily be incorporated into applicable devices, such as projectors or lab equipment or add on devices to TV, computers, etc.

The input devices taught herein can be remote (such as a TV), integral with (such as a cell phone) or removable (such as downloading onto a PDA) from the equipment, depending upon the size and type of equipment.

The disclosed technology provides benefits in a laboratory or other setting where equipment is centrally stored and removed for use. Locking stations, similar to those used for laptops, hold the equipment in place until the user enters their user ID code into the locking station. The equipment is then released with the equipment ID and other relevant data, including activation/deactivation time, being stored in the locking station and equipment. Each employee would have a personalized touch key, or other wireless or non-wireless access means, that would record the employee name, time of activation, and any other information required by the employer prior to activation of the equipment.

When the device cannot be programmed using systems inherent for the use of the device, such as available on a computer, TV, digital camera or cell phone, alternative programming "keys" containing static data, such as a touch key, swipe card, USB cable, etc. can be used. The disclosed technology provides the advantage that an employer, or parent, can program the "key"

with the pertinent data, including activation time, and, if applicable activated features. In the preferred embodiments the data downloaded into the device cannot be changed except by a user having primary, or programming, rights. This is advantageous when using equipment, such as machinery that must be shut down after a specific period of use as the preprogrammed time relieves the user from the responsibility of watching a clock. Although on some equipment shut down could also be obtained through other methods, the disclosed system provides the additional advantages as set forth herein, thereby consolidating systems.

When installed on a computer, the disclosed device can be connected directly to the power supply or programmed into the chip, hard drive or other storage/memory device; permitting businesses that sell computer time to automatically shut down the computer unless additional time is purchased. In home use, the device permits scheduling and/or control of the amount of time, or specific time periods, the computer, or other electronic devices such as a TV, cell phones, VCR, camcorders, etc., can be used by someone without the programming, or primary, access code. Thus, the computer, VCR, cell phone or TV could only be activated after homework time is over, during specific time periods, for a certain period of time, etc.

Computers are especially adaptable to keyboard programming of the device, although a keyboard interface can be included with any of the locking devices disclosed. A program embedded in the device's microchip and/or hard drive can allow for a either a simple timer setting that is activated through key input on the keyboard or setting the more complex functions as disclosed herein. As an option, a direct coding key can be incorporated on the keyboard that automatically accesses the program and permits activation, setting changes, etc. Although

computer lock out programs are known in the prior art, they totally lock out use of the computer in an all or nothing method. The disclosed device permits access to the computer for a predetermined period of time either at random times or within a specific scheduled time period. Optionally, a programming user-determined number of "extensions" can be programmed into the system permitting the user to extend the amount of time to use the device without interruption. To prevent the extensions from continuing indefinitely, the primary user, or manufacturer, can program in the maximum number of extensions accessible within the specific time period. For example, the system can be set to enable the computer to be turned on at a predetermined time, used for a specific time period, after which the computer cannot be used until the next preprogrammed activation time. This enables a parent to leave the house after programming the schedule for the computer, or other electronic device or equipment, to activate at 6 pm until 10 pm after which it either deactivates until the follow day at 6 pm or is activated in response to other programming by the primary user. The primary user entering the time restraints would set up the program with a primary user code to prevent unauthorized changes to the program.

One of the programmable features disclosed herein is a partial activation feature, as described in detail hereinafter with relationship to cell phones. Using this feature, the user can restrict partial use of the electronic equipment, for example a computer can be programmed to restrict certain applications, such as web access, instant messages, email, specific websites or type of site, during specific blackout time periods. For example, children could be prevented from surfing the web except during specific time periods. Or computer games could only be accessed for a restricted time, however the computer could be used for word processing or other

homework related activities. This feature enables the computer to be used, but in a restricted manner, based upon primary user programming. Additionally, sub-user ID's can be used to permit individual access to an electronic device. This is advantageous with children having different age restrictions by permitting the older children to access programs, make long distance calls, etc., that are unavailable to younger children.

The disclosed locking device is also advantageous for rental equipment, such as generators, compressors, VCR's, etc., in that the rented equipment can be programmed for a specific period of time and after that point be automatically deactivated. This discourages the theft of rental equipment, thereby reducing insurance and liability, since by preventing unauthorized use, especially when used in conjunction with larger equipment, insurance rates would potentially be reduced.

In electronic equipment, such as TVs, VCRs, etc. containing infrared remote controllers, the timing activation device can be activated through the remote controller. Once activated the program would appear on the screen and utilize either existing or specific keys to set the shut down time, user time periods, or extend the time period, etc. This would be an inexpensive addition to a controller and increase user convenience. Alternatively, the controller itself can be used to set the time of use, without the appearance of the setting program on the screen.

It should be noted that the use of analogue, key scanners, infrared, fingerprint or retinal recognition, etc. taught herein for use by a specific embodiment, is not limited to that embodiment. Each embodiment of the locking device disclosed herein can incorporate the electronics, memory, etc. as described herein in relation to any other embodiment.

For optimal use, the disclosed system requires initial set up with the current program and periodic updates. The set up will be dependent upon the embodiment incorporated and, for the most part will be evident.

A hand drill, as illustrated in Figures 1 and 2, is used to illustrate the disclosed mechanism used to limit user time, however this is as an example only and is not intended to limit the invention. The power tool 10 is illustrated in Figure 1 ready for use, incorporating a numeric keypad 12 as the locking mechanism and other activating mechanisms will be apparent to those skilled in the art.

The time can be set through any means appropriate to the equipment being used as well as the final use. For example, the time can be through repeatedly touching a specific key, jumping the time by predetermined increments. Alternatively, an "enter" key can be provided which allows entry of the unlocking code and subsequent entry of a predetermined period of time. Preferably, all timed locking devices are provided with nonvolatile memory to prevent the loss of programmed instructions in the event the item's battery goes dead or is removed. This is more critical with rechargeable hand tools where completely discharging the battery is sometimes required to fully recharge. If requires password and unplugged becomes inoperable.

In some uses it can be advantageous, in devices that require passwords to operate, for the system to be programmed to eliminate all, or some, of the passwords contained in memory once power is lost or there is a substantial power variation, such as occurs in recharging. If the device is programmed to eliminate the master or operating password, the user would be required to contact an authorized agent, such as the manufacturer or a head office, to reprogram a new

password or obtain a password device, such as touch key. If the programming eliminates the secondary user passwords, the master, or primary, user would need to program in new passwords. The device would be inoperable until an acceptable reentry sequence is entered. The use if a nonvolatile memory enables the basic programming to be retained within the system, with only the password being removed.

The incorporation of a microchip to register the locking codes and program the activation time further provides the added ability to monitor various other tool functions. For example, an LED display 14 of Figure 1 can be included which indicates the activation time remaining and, if desired, the current status of the tool. The status can include, for example, current battery power (both during recharge and discharge), pressure remaining when air tools are used, rpm and direction of drills, etc. This is of optimum use in monitoring the status of rechargeable batteries. Since many rechargeable batteries do not either fully charge unless fully discharged prior to recharging, the battery-monitoring device permits optimum use and management of the battery. It should also be noted that an LED could be provided on the recharging device to monitor the battery recharge thereby serving as a double check to the LED on the device being charged.

In Figure 2, one design of the internal activation unit 40 is illustrated. The locking arm 48 is supported between the upper case side 42 and the lower case side 44. The spring tension 50 is designed to place the solenoid contact 56 in physical contact with the solenoid 52 when the locking arm 48 is pulled back during use. Once the locking arm 48 is released, the solenoid contact 56 is removed from contact with the solenoid 52. The solenoid 52 receives power from the battery 108 (Figure 5) through the controller 80, an example of which is illustrated in more

detail in Figure 3. As can be seen from the example schematic of Figure 4, the controller 80 serves as the central processing area, with all input and output passing through the controller 80. The controller 80 is connected directly to the locking mechanism, such as a numeric keypad 12, through the keypad wiring 100. The battery wiring 102 and motor wiring 104 also feed into the controller 80. Once the locking means, such as numeric keypad 12, is activated, all connections are made and power is free to go to the driver specific to the power tool 10. The exact schematic of the wiring is not critical, as the criticality lies with in the interaction between the locking means and the controller 80. The interior of the hand tool 10, as shown in Figure 5, is traditionally spaced, with the controller 80 located within the handle area. In this embodiment, the various connecting wires 100, 102 and 104 are exposed and, in the event of theft, the case can be opened and the wires cut and crossed to bypass the controller 80. In order to prevent a thief from opening the case and by passing the controller 80, the case is provided with a safety lock key having a number of different embodiments. One embodiment is to incorporate a locking member, wired to the control through the locking wire 156, that is deactivated by a locking code, key or other compatible methods. The controller 80 can be programmed to allow the case to release, for example through a separate code being entered or by holding down the last number of the existing code for a predetermined time period. A separate code is preferable in that it prevents any unauthorized access to the interior of the case.

In an alternative embodiment to the safety lock key, the solenoid 126 and wiring 122 are encased in an epoxy, indicated herein as region 128, as illustrated in Figure 6. By encasing the wiring 122 within the epoxy, it is impossible to rewire the unit and bypass the controller 124.

Other materials, known in the art, can be used to replace the epoxy. To facilitate the placement of the epoxy region 128, the wiring 122 from the motor 120 exits the motor casing proximate the controller 124, which has been placed as close as possible to the solenoid 126. This revised placement reduces the area to be protected, thereby reducing material and labor costs. Revising the placement of the battery 130 is difficult, preventing in some instances the battery wiring 132 from being covered. However, with the controller 124 and solenoid 126 both encased in epoxy, there would be no value to cutting the battery wire 132, as there would not be any accessible power connections.

In Figure 7, the locking device is illustrated being used with an air tool 200, although it should be noted that the device can also be used with propane, gas, and diesel tools and equipment. The controller unit 202, as illustrated, is located in the handle 204 of the air tool. As can be seen in the example schematics of Figure 4 (battery) and Figure 8 (air tool) there is little difference in wiring between the two. As stated, in the schematic of Figure 4 the touch key-wiring 100 goes to the controller 80, as does the battery wire 102 and the motor wire 104. In the air tool, or other removed power source, the touch key wiring 150 and solenoid 154 wiring feed into the controller 152 and onto the driver, the battery and motor connections being eliminated.

As stated heretofore, the disclosed device can be easily incorporated with electronic equipment. The programming of the equipment can be through a number of methods and additional methods will become evident as technology changes and will be evident to those skilled in the art.

Rewrite swipe cards are gaining popularity and can easily be incorporated with the disclosed device. The cards can be rewritten with the new codes using a computer or other applicable device, such as a palm or remote control. For example, a computer program can contain the applicable coding for all the electronic devices which incorporate the disclosed technology. A user can select the functions to be incorporated for each device and write them to the card. The user can then use the same swipe the card to program each of the electronic devices available as each device will recognize its codes and ignore programming for other devices. Alternatively, a small hard drive, such as used in digital cameras, can be used to program the various electronic devices. It will be obvious to those skilled in the art that the input means must be compatible with programming device implemented. The equipment can also have multiple methods of inputting data such as swipe card and computer download.

The schematic of Figure 9 is an example of the electronics for a device being incorporated into a computer, VCR, television, etc. As can be seen, the basic functioning of the antitheft device is the same as used for a battery operated, air or electric tools or other devices. As in the schematics disclosed herein, the touch key wiring 302 feeds into the controller 304. In this embodiment, however, the electric wiring 306 is connected to the controller 304 through the latching relay wires 308. The schematic of Figure 10 provides an example of the electronic layout, disclosed in Figure 9, to incorporate the analogue function into the device through analog wiring 350.

As stated heretofore, cellular phones are a small sized, high dollar theft item that is difficult to protect. Most people leave their phones on all of the time so that the implementation

of an on/off-activated lock would not prevent theft; as the phone would most likely be turned on when stolen and a thief would simply leave the phone on. Incorporating the disclosed system, the thief would know that there was no way to stop the phone from shutting down at a pre-designated time and that once the pre-designated time had expired the phone would be unusable. Using the disclosed system, the user could program the phone to shut off permanently at the expiration of a predetermined time or, alternatively at a preset time. For example, this would enable the user to tell the system that it should shut off at 9:00 p.m., or alternatively once the timer reach three hours from the programming time. Once shut down, the device would require reentry of the access codes. The disclosed system further enables a user to set the phone to shut down for a predetermined period of time, with automatic reactivation at the end of the time period. The ability to turn the phone off for a predetermined period of time, after which it automatically reactivates for a predetermined time based upon user programming, is beneficial for people attending meetings, movies, or some other activity that requires the phone to be turned off. Since the phone will automatically reactivate, the user does not need to worry about turning the phone back on. In the preferred embodiment, the phone can also be set to either receive calls or make calls, during a user programmed time period, as an option to the standard incoming/outgoing feature. Thus, if the phone is being loaned out and the owner of the phone does not want his/her calls to be picked up by anyone else, the phone can be set to forward all of the phone owner's incoming calls to their voice mail or other call forwarded location, while still allowing the person having the phone to make outbound calls. In the reverse mode, the person having the phone can receive calls, but cannot use the phone to call out.

It should be noted that for maximum security, the code enabling the programming disclosed herein is preferably on the phone, or other equipment's, permanent memory device, such as hard drive, microchip, etc. and is not solely dependent upon any temporary software, phone card or other removable system.

A delayed activation/deactivation can also be programmed into any of the devices to enable activation/deactivation at a specific time or after a certain amount of time has lapsed. Thus, in applications such as the electric tools used on a construction site, the foreman can program the tool to activate in thirty minutes and to stay activated for an additional eight hours.

In any electronic device the commands can be set through a variety of methods. On equipment that has a built in a screen, such as a digital camera or cell phone, the screen can be used to monitor the exiting settings and program new settings. In devices without screens an external LED display, voice activation, or some other means of forming communicating between the device and the user can be incorporated. The existing command or program buttons can be used to program the device or additional buttons can be incorporated into the design at the time of manufacture. Additionally, remotes, infrared, Bluetooth, Internet, telephone or cell phone or other wired or wireless devices can be used as a programming tool.

A sample of a sequence for the user to follow when programming a cell phone is illustrated in Figure 11. Once the device is activated 600 the system inquires whether the user would like to activate the programming mode 602 or, if no changes are to be made entering the use mode 603.

Use Mode

If the user chooses to simply use the system 603 or 701, they simply enter the personal code 605 or 703 and the system returns to the previous program or the standard operation for a time period set by the manufacturer. If the user chooses to alter the previous program, the user has either changed their mind or made the incorrect selection, they indicate "no", the programmed features remain as currently set and the option to go the program mode would be offered. It should be noted that the safety issues disclosed herein would be negated if the user was able to simply turn off the locking system. In the preferred embodiment the manufacturer sets a default maximum amount of time that the phone can be continuously activated, after which it automatically shuts down. This maximum operational period is preferably applicable not only to cell phones but all devices using the disclosed locking system. The maximum time can be set by the user using a separate code, either single or multiple use, from the standard programming.

In Figure 13, the additional option of resetting the system is added, enabling the user to either deactivate or reset the system 803. If the system is deactivated, the user enters their personal code 812 and selects whether they wish to deactivate 812 or reset 814. If deactivate 812 is selected the system enters fallback operation 810, again incorporating the preferred restriction of a maximum operating time. If the user selects to reset 814 the system then goes to the timed operation sequence 816, the system continues following arrows A1000 and A1002, following the sequence as set forth in Figures 11 and 12. It should be noted that arrow A1004 serves as the return from the "no" selection at the end of the programmable options.

It should be noted that the term fall back as used herein can relate to either the default set by the manufacturer or the last programmed codes. The fall back preference is set at the initial programming by the user at the time of set up.

Programming Mode

If user answers "yes" to the Program Mode 602, or activate, the system, as illustrated in Figures 11 and 12, asks if the user if they wish to program, and requests the personal code 604. If the code is correct, the system either enters into the programming selections 706 or enters fallback operation 610, again for the maximum operational period. This permits either the previously set parameters to be repeated until a change in programming is required or the factory set default mode entered. If the user answers "yes", the system requests the personal code be entered 604 and, if correct, the user is then presented with several modes from which to select. These modes can be viewed by scrolling or, depending upon the size of the screen, all displayed with the arrow keys enabling selection. It should be noted that the sequence discussed herein in respect to this Figure is not intended to limit the invention in any way and different sequencing, alternative actions, etc. can be incorporated.

The Timed Operation mode 614, provides the user the ability to shut down the operation of the device by clock setting 636 or number of minutes 640. In the event the clock setting 636 is selected, the user then enters the time of day that the device shuts down 638. If the minutes 640 module is selected, the number of minutes prior to shutting down is requested 642. Preferably, a preset maximum time of operation will still prevail after which the user code would be required to reactivate the phone. The selection of "no" as a response brings up the sleep mode

620 operation which, if entered through, enables the user to set a start time 644 and an end time 646 during which the device is inoperable. "No" again bypasses the sleep mode 620 to the delay start 626 mode which enables the user to set the commencement of the start time 648 at a time later than the time of entry. The end time 650 is similar to the sleep mode end time 646. The partial operation mode 634 enables the user to separate the ability to make calls 652 from the ability to receive calls 654. When the make calls 652 operation is selected, the user enters the start time 656 and the end time 658 during which calls can be made. The receive calls 654 also permits start time 660 and end time 662 entry. In the event the user selects none of the modules the system returns to the "activate locking system" mode 604.

Depending upon the end cost, the device can be programmed to accept multiple different commands, such as a sleep mode 620 where it does not operate from the start time 644 to the end time 646, as well as a timed operation 614 in which the device shuts down 638 at 8:00 pm.

Alternatively to pressing yes and no, the user can scroll through the options, pressing the enter button, or its equivalent, to make the selection.

Extend Time

The devices can be provided with an extend time feature 822, as illustrated in Figure 13, and it should be noted that although the devices can be provided with this feature, as noted heretofore, it cannot permit endless extended time as that would eliminate the security concept. In this embodiment, the user activates the device 802, selects to activate/reset the system 803 and enters the personal code 812, the option of extend time 822 is presented. In the extend time option 822, the user can extend the time of the current programming equal to, or less than, the

original program period. The amount of time for extension can be determined by the manufacturer and would be unchangeable by the user. For example, the phone can either shut down upon expiration of a preprogrammed maximum operational period or after a preset number of extensions 822. Alternatively, with systems that incorporate primary and secondary user access codes, the extended time period can be changed through use of the primary user code.

In Figure 12, rather than enter a specific start time, as set forth in the prior Figure, a default time has been entered. Once the user activates the device 700, responds positively to activating the locking system 702 and enters the personal code 704, the timed operation mode 704 appears. Upon positive selection of the timed operation mode 706, the default start time 708 is displayed, giving the user the opportunity to increase 710 or decrease 718 the time by either minutes 712 or hours 714. It should be noted that the use of minute and hours for example only and the time categories can be days, weeks, or any increment selected by the manufacturer. The default end time 716 is adjusted in the same fashion. Each of the modes in this Figure provide the default time options, however it should be noted that the default modes illustrated in Figure 12 can be also included in conjunction with the timer setting modes illustrated in Figure11 Alternatively the user can be provided with the choice of whether to select the default or the timer settings.

Figure13 would be more applicable for cameras, TVs, computers and other devices that have only one type of operation. In other words do not have the dual operations, send and receive, as does a cell phone or a VCRs record and play. It should be noted that the system as disclosed in Figure 13 is used in the same way as explained in Figure 12.

In the embodiment of Figure 14, the user is able to program one or more specific events and their playing time. As used herein, an event includes computer programs, television shows, radio stations, or any other specific event that is viewed or listened to through the electronic device. For example, between 7:00 pm and bedtime, by controlling the stations that can be viewed, a 12 year old could only watch specific shows and, at bedtime, the TV would no longer be accessible. To accomplish this, the primary user activates the device 900, and is asked whether they are to program 934 or view 932. Entry of program 934 inquires whether the primary user would like to activate the locking system 902 or deactivate the system 903. As with the prior embodiments, if the primary user decides not to activate the system, the personal code 904 is requested and the device enters fallback operation 910, again with the maximum running period or previously programmed time. If the primary user wishes enter a programmed operation 614, they enter the start time 940, end time 942, user code 946 and the program code 952. This tells the system that at the start time the secondary, or non-programming, user matching secondary user code 946 can watch the program entered into the program code 952 while other programs are blocked. To facilitate programming, multiple user codes 946 can be entered, or checked off on a list. Once the program code 952 is entered, the user can either repeat 948 the programming event 914 or end 950 the event. When returned to the programmed event 914, the user can either program another event or continue on to other modes contained on the device, such as those illustrated in Figure 13. Alternatively, a next mode 954 can be accessed directly from the program code 952 module.

If the user wishes to view 932, the user code 930 is entered and the system permits viewing of the preprogrammed events. This system is for use predominately on TV's and computers, however other applications will be evident to those skilled in the art.

Since many homes have more than one TV, VCR, etc. that would require programming, a master program can be placed on one of the devices that transmits, using Bluetooth or other wireless, or wired, technology, the codes to one or more of the other devices. Thus, a parent could sit at their computer and program all of the other devices within transmission range.

Figure 15 illustrates the flow for a primary/secondary user system which can be incorporated on any electronic system, such as a cell phones, TV, VCR, camcorder, computer, camera, etc. The user activates the device 1000 and enters the user code 1002. In the preferred embodiments, once the device is activated 1000, a prompt is given, either visible or audibly, providing the user with instructions to enter the user code or the device will shut down in a predetermined period of time. The length of time that the message, or warning, is displayed can vary with the type of device and would generally be set by the manufacturer although it can be provided as part of the user set up. An "entry required" message or indicator can also be provided at start up or just prior to a change in programming or shutdown of the device, requesting users enter a password, within a preprogrammed period of time, to enable them to continue the current mode or switch to a different mode. The device can continue to run during the preprogrammed period of time prior to entry of the password. As the system is programmed with primary and secondary codes initially, the system will recognize the user's code. If this is a secondary user 1004, the system checks for valid operating time 1006 and if the time is valid

1008, proceeds to operate the device 1010. Based upon a time set by the manufacturer, the system will periodically verify that the operation is still within the programmed parameters and that the time is valid 1012. If there is time remaining in the system 1014, the device will continue to operate 1010. Once, however, that the system detects that there is no longer valid time remaining 1016, the system will show a warning 1018 and shut down 1020. Although the display of a warning is optional, it provides a convenience for the user. The warning can flash on saying the amount of time left and the action to be taken to extend the time. If, when the system recognizes the secondary user code 1004, the checking for valid operating time 1006 reveals that this is not a valid time 1022, the system will shut the device down. 1024.

If the user code is a primary user 1030, they are asked whether they wish to operate the system 1032 or program the system 1034. If they wish to operate the system 1032, the system checks to see whether this is a valid operating time 1036. If valid 1038 the system proceeds to operate the device 1042, continually verifying the time 1044. As long as the time remains valid 1046 the system will continue to operate the device 1042. Once the time is expired 1048, a warning is shown 1050 and the device shut down 1052. If, upon initial check for valid operating time 1036, the system finds that the time is not valid 1054, the device is shut down 1056. Alternatively, a primary user code can eliminate the check for valid time and enter into the default mode. If the user selects to program 1034, the system follows the chart of Figure 16. Alternatively, the systems can be programmed to ignore the time requirements with the entry of a primary user code.

As seen in Figure 16, from the program option 1030, the primary user enters the user codes that are permitted access 1050 to this set. Once the codes are established the start time 1052 and the end time 1054 are entered. The channel or program 1056 is the entered and the user either ends the operation 1060 or goes to the next 1058 set, repeating the process.

The process illustrated in the flow chart of Figure 15 can be used for any of the foregoing embodiments while the process of Figure 16 is directed more toward TVs, computers and radios. It will be obvious to those skilled in the art that the indicators in the channel or program would be reflective of the applicable device. Therefore, a TV would indicate either channels or show name while a computer would indicate specific applications that could be used.

The timing on the device can also be measured in the completion of predetermined units, such as revolutions of a wheel, time passed, piston stokes, etc. and is illustrated in Figure 18. This permits an action to be taken based upon use, rather than upon a time period. In a cell phone this would be the number of minutes the phone would be used while in a car it would be reflective of either the piston strokes or the revolutions of a wheel.

Upon activation of the device 1250 the system immediately looks for updates 1252, in the way of instructions or additional units. Any additional units received 1254 are added to the remaining units 1256. Simultaneously, the system requests the entry of the user code 1258. If the code is a secondary 1260, the system checks the remaining units 1262 and, if there are less than the preprogrammed minimum units 1264 the system issues a warning 1280 and automatically sends a signal to the notification number 1282. If there are more than the minimum units remaining 1266, the device can be used 1268. The system logs the start 1270 of

that cycle and loops through deducting from the remaining units 1272, checking against the minimum1274 and taking action on that check. If the units are less than the minimum 1276 the warning 1280 is issued. If greater than the minimum 1278 the system continues its loop. Once the preset number of minimum units is reached, the control system can signal or send a message to a notification number 1282. The minimum number of minutes is preset by the user or manufacturer based on type of device and end use. Preferably the remaining units 1262 are displayed on the device either continuously or periodically.

If the user code 1258 is a primary user code 1290, the system provides the option of either program 1292 or operate 1294. The operation mode 1294, not illustrated here, can follow an unrestricted or any of the other paths disclosed herein. The program mode 1292 requests the number of available units 1296, the number of refill units 1298 and the notification number 1300 which is to be called upon the device reaching the minimum units 1276.

For example, if a teenager's phone is programmed to have 100 available units, or minutes, to use and the minimum number that the parent wishes the child to have would be 20. When the child activated the phone, they would be notified that there were x number of minutes remaining and, once the phone reached the minimum number, it would automatically contact the notification number. The parent could then decide whether they wanted to refill the minutes or let the phone time run out. If they wished to refill the minutes, they would access the phone either physically or remotely, and follow the programming illustrated above.

This can also be used in equipment, such as forklifts, that should have maintenance every x number of units, whether it is based upon revolutions of the wheel, strokes of a piston or time.

This provides the advantage that the service schedule is based upon actual use not theoretical use.

In an alternate embodiment, illustrated in Figure 17, in addition to any of the applicable above features, the system is programmed to completely shut down if the power is removed from the device. In electronic devices, there is a constant contact with power, either through the electric plug or battery, with many devices having a waiting mode. In the disclosed system, as long as the power is in contact with the device, the device does not register a disconnect. Once, however, the power is completely separate from the device, a disconnect is registered and the system requires entry of a master code. This helps protect the device from theft since a thief will know that they will be unable to restore the functionality of the device once unplugged.

In Figure 17, once the system is activated 1201, the system continually checks for power 1200, with the presence of power 1202 creating a loop. If there is no power 1204, caused by separation of the battery from the device, electrical cord from the plug, etc. the system sets the disconnect register 1206, enters a "password required" mode, and causes the disconnect status 1208 to be registered as "on". It should be noted that the default status, when receiving power is "off". Once power is completely disconnected, the no power 1204 state causes the disconnect register 1206 to switch the disconnect status to "on" status; causing a total shut down of the system 1214. After the restoration of power 1216, the next attempt to activate the device 1228 will cause the system to check the register disconnect 1226. At this point, the disconnect status 1208 is "on" 1212 indicating the device requires the entry of the master code 1218. Once the master code is entered 1218, the code is verified 1220 by the system. If the code is recognized, or

"yes" 1224, the system will allow the device to be run 1230. If, however, the system does not recognize the entered master code 1222, it requests a reentry of the code 1218. The system will continue to loop 1232 for a predetermined number of times set by either the manufacturer or the user during set up.

In rechargeable devices, such as cell phones, power tools, etc., in addition to removing the power source, reentry of the password can also be required when the device is placed onto the battery recharger. In this embodiment the system constantly monitors the power within the device, allowing for the gradual decrease that is normal due to use. Any extreme fluctuation in power, whether it is an increase, such as regeneration, or a decrease, such as removal of power, requires the reentry of the password.

In Figure 19, the system differentiates between a decrease in power due to use, decrease due to removal and an increase in power. This embodiment is most applicable to devices with batteries, although it can also be used for plug in devices. The power is monitored 1400 by the system with consistent power 1402 creating a loop. If, however, there is a power fluctuation 1404, the system checks whether it is an increase in power 1406 or a decrease in power 1408. A decrease in power 1408 due to normal use 1410 takes the system to run device 1430 and continues the loop. However, if there is a rapid loss of total power 1412, the system sets the disconnect register 1414, creating a total shut down of the system 1418. Once power is restored 1420 and the device activated 1422, the disconnect register is checked 1424 and the disconnect status 1415 checked. If it is off the device can be run 1430 and the system returns to the loop. If, however, the disconnect status 1415 is on 1416, the system requests the entry of the master

code 1428. If the code is verified 1432, the device can be run 1430. If the code is incorrect 1434, the system loop for a predetermined number of attempts 1436 until there is permanent shut down.

In the preferred embodiment for plug in devices, as illustrated in Figure 20, the system monitors the power 1500 detects the difference between the loss of power 1502 due to the removal of the power source and the loss of power due to an outage. In the illustrated embodiment a proximity sensor is placed in the plug that registers whether or not the plug is registering the proximity of the socket. When there is a rapid loss of total power 1502, the system checks the sensor 1504 to determine the status. If the sensor remains connected 1540, the disconnect status 1518 remains in the off position.

If, however, the sensor is disconnected 1506 the disconnect register is set 1508, creating a total shut down of the system 1510. Once power is restored 1512 and the device activated 1514, the disconnect register is checked 1516 and the disconnect status 1518 checked. If it is off the device can be run 1520 and the system returns to the loop. If, however, the disconnect status 1518 is on 1520, the system requests the entry of the master code 1522 for verification 1524. If the code is verified 1526, the device can be run 1520. If the code is incorrect 1528, the system loop for a predetermined number of attempts 1530 until there is permanent shut down.

The flow chart of Figure 20 is only an example and other methods for recognizing the power outage due to unplugging will be evident to those skilled in the art. Another method that can be used would be to place a motion sensor on either the plug or the device itself to sense movement. Any sensors would be connected to an internal battery that would enable the system

to differentiate between a power outage and an unplugged unit. Since the main purpose of this embodiment is to prevent theft, the system can be provided with an override code that can be used by the owner to move the device from location to location.

When any of the above embodiments are used with networked computers, the system can be programmed to put one or all of the computers into either a password protect mode or password clear mode, if one is unplugged. Alternatively, the system can be programmed so that during business hours only the computer, or other device, unplugged goes into password protect mode but after business hours, all devices go into that mode if a single unit is unplugged.

As an additional anti-theft measure, the device can further have an alarm that is triggered by the disconnection from the power source. The alarm, visual, audio or both, must have its' own power, preferably through rechargeable batteries, as it will only be activated at the absolute removal of power from the device. Thus, if the TV is unplugged an alarm is sounded, however, as stated heretofore, the system should be programmed to prevent the alarm from sounding during a power outage. The disclosed system can further be tied in with the household alarms system through a variety of methods that will be evident to those skilled in the art. For example a transceiver, which interacts with a transceiver in the alarm system, could be placed within the device and upon a predetermined separation distance, the alarm is triggered. Alternatively, a timed motion sensor could be used that will activate after a preprogrammed time period of movement. Other methods, such as Bluetooth, magnetic strips, etc. can be used to activate the in house alarm system. A GPS chip could also be incorporated to track the device and facilitate recovery. To enable the user to move the device without setting off the alarm, a override

password is programmed into the system, thereby turning off the alarm interaction for a predetermined period of time. It is preferable that the override code does not turn off the alarm totally as it would be easy for a user to forget to

The disclosed technology relies, in many embodiments, on the use of passwords to access the system. In the event that a password is lost a call in customer service, either human or remote, can be established. Each device would have a password default code that would display a series of numbers. These numbers would be given the customer service and the corresponding default password would be provided. The default password would permit the user to enter the set up stage of the system and enter the new password. For additional safety, the default code can be tied to caller ID. This provides two advantages; first if the number from which the call is made does not correspond to the initial phone number upon registration, additional data will be required. This is currently in use by credit card companies to activate cards and can easily be adapted to the disclosed technology. Additionally, if the call is not made from the registered number, and the equipment has been stolen, the recordation of the phone number will help police locate the stolen merchandise.

One use of the disclosed invention is in commercial industries with workers using company owned tools and equipment, computers, motel TVs and VCRs, etc. The tools, or other equipment, are activated in the morning to run for an entire shift, at which point they shut down. This prevents theft from outside sources as well as employees. Additionally by reactivating the tools each morning, a "safety check" can be incorporated with the activation to prevent faulty equipment from being used.

Since other modifications and changes varied to fit particular operating requirements and environments will be apparent to those skilled in the art, the invention is not considered limited to the example chosen for the purposes of disclosure, and covers all changes and modifications that do not constitute departures from the true spirit and scope of this invention.